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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,652	02/28/2002	William R. Ashurst	02307V-121600US	6884
20350	7590	11/08/2004	EXAMINER	
TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			MARKHAM, WESLEY D	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,652

Applicant(s)

ASHURST ET AL.

Examiner

Wesley D Markham

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/13/04 (the RCE).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application on 9/13/2004 after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office Action (i.e., the final Office Action mailed on 6/3/2004) has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/21/2004, including the supplemental declaration of Mr. William Ashurst, has been entered. **Claims 1 – 6 and 9 – 21** remain pending in U.S. Application Serial No. 10/086,652, and an Office Action on the merits follows.

Response to Declaration under 37 CFR 1.131

2. The declaration filed on 6/21/2004 under 37 CFR 1.131 has been considered but is ineffective to overcome the Leung et al. reference. To begin, the examiner notes that the declaration filed on 6/21/2004 is a supplemental declaration by Mr. William R. Ashurst, which includes a transcription of the entries in Exhibit B of the March 4 declaration of Mr. Ashurst, plus the declarant's explanation of each of the entries. The examiner also notes that all the claims pending in the instant application (i.e., Claims 1 – 6 and 9 – 21) were rejected under 35 U.S.C. 103 based, at least in part, on the Leung et al. reference. However, the aforementioned 37 CFR 1.131 declarations were only made by Mr. Ashurst, who is one of four joint inventors of the

instant application, along with Roya Maboudian, Carlo Carraro, and Wilhelm Frey. MPEP 715.04 states that a declaration under 37 CFR 1.131 must be made by all inventors of the subject matter claimed, and a declaration under 37 CFR 1.131 by less than all named inventors is only accepted when it is shown that less than all named inventors invented the subject matter of the claims under rejection (which cannot be the case in the instant application, because all claims are under rejection). For this reason, the 37 CFR 1.131 declarations of Mr. Ashurst are ineffective to overcome / antedate the Leung et al. reference. The examiner does note that the evidence presented in the combination of the two declarations, along with the applicant's arguments submitted on 6/21/2004, does appear to be sufficient to establish a reduction to practice of the claimed invention in this country prior to the effective date of the Leung et al. reference (i.e., 5/7/2001).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. **Claim 10** recites the limitation, "said dichlorodimethylsilane" in line 3 of the claim.

There is insufficient antecedent basis for this limitation in the claim. Specifically,

Claim 10 previously recites, "dichlorodi(C₁-C₃ alkyl)silane", not dichlorodimethylsilane. Therefore, it is unclear whether Claim 10 requires that the silane be dichlorodi(C₁-C₃ alkyl)silane (more broad) or dichlorodimethylsilane (more narrow), and as such, the scope of Claim 10 is vague and indefinite.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 – 4, 13, 14, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Robbart (USPN 4,554,215).
8. Regarding independent **Claim 1**, Robbart teaches a method for applying a silane coating to a cellulosic web (i.e., a surface that is at least partially wettable by water), the method comprising exposing the surface to a vapor-phase dihalodi(C₁-C₃ alkyl)silane under conditions resulting in the reaction of the silane with hydroxyl (OH) groups on the surface of the cellulosic web (Abstract, Col.1, lines 6 – 12, Col.2, lines 15 – 43, Col.3, lines 7 – 60, Col.4, lines 1 – 32 and 58 – 68, and Col.5, lines 1 – 37). The total pressure during the exposure is, for example, 1 Torr (a value within the applicant's claimed range) (Col.3, lines 57 – 60). The cellulosic web is also exposed to moisture and humidity in the air (i.e., water vapor) during the silane exposure

process (Col.2, lines 24 – 25, Col.3, line 35, Col.5, lines 18 – 22), but the air to be mixed with the silane in the treatment step should contain as little water as possible to avoid significant reaction of water in the air with the silane, which produces undesirable by-products and reduces the amount of silane available to react with the cellulosic material (i.e., the atmosphere is “non-oxidizing”, as claimed by the applicant) (Col.5, lines 3 – 8). Robbart does not explicitly teach that the conditions result in the bonding of di(C₁-C₃ alkyl)silyloxy groups to the surface of the web. However, the “conditions” of the process of Robbart, including (1) the specific vapor-phase silane compound utilized (DCDMS), (2) the surface to be treated (i.e., one that comprises hydroxyl groups), (3) the process temperature, and (4) the process pressure, are the same as the applicant’s claimed and disclosed process “conditions”. Therefore, unless essential process steps and/or limitations are missing from the applicant’s claims, the process of Robbart would have inherently resulted in the bonding of di(C₁-C₃ alkyl)silyloxy groups to the surface because the process conditions of Robbart are the same as the applicant’s process conditions. Regarding **Claims 2 and 3**, Robbart also teaches that the dihalodi(C₁-C₃ alkyl)silane is a dichlorodi(C₁-C₃ alkyl)silane (Claim 2), specifically dichlorodimethylsilane (i.e., DCDMS) (Claim 3) (Col.4, line 29). Regarding **Claim 4**, the cellulosic web of Robbart is hydrophilic (Col.3, lines 7 – 16 and 29 – 30; Col.5, line 21). Regarding **Claims 13 and 14**, the total pressure during the exposure is, for example, 1 Torr (a value within the applicant’s claimed range) (Col.3, lines 57 – 60). Regarding **Claim 19**, the cellulosic web of Robbart has exposed hydroxyl groups (Col.2, lines 20 – 40).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
11. Claims 11, 12, and 15 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robbart.
12. Robbart teaches all the limitations of **Claims 11 and 12** as set forth above in paragraph 8, except for a method wherein the DCDMS is at a partial pressure of from about 0.5 torr to about 5 torr, particularly from about 1.0 to about 3.0 torr. Specifically, Robbart is silent regarding the partial pressure of the DCDMS. However, the overall pressure in the reaction zone can vary widely (e.g., 1 torr to

about 760 torr) (Col.3, lines 57 – 60), and the concentration of the silane in the atmosphere (i.e., the “partial pressure” of the silane) is a variable that influences other factors, such as how long the exposure should last (Col.3, lines 22 – 56). In other words, Robbart teaches that the concentration / partial pressure of the silane in the atmosphere is a result / effective variable that influences how long the cellulosic web should be exposed to the atmosphere. Therefore, it would have been obvious to one of ordinary skill in the art to optimize the DCDMS partial pressure in the process of Robbart as a result / effective variable through routine experimentation (e.g., in order to optimize the contact time).

13. Robbart teaches all the limitations of **Claims 15 and 16** as set forth above in paragraph 8, except for a method wherein the exposure is performed at a temperature of from about 0° C to about 85° C, particularly from about 15° C to about 50° C. However, Robbart does teach that the temperature during the exposure is from 50° F to about 200° F (i.e., 10 – 93° C) (Col.3, lines 32 – 39), which is a range of temperatures that overlaps / encompasses the applicant's claimed range. Therefore, it would have been obvious to one of ordinary skill in the art to utilize an exposure temperature within the range claimed by the applicant because Robbart teaches that temperatures in the claimed range are suitable for such a process. Please note that, in a case where the claimed ranges overlap or lie inside ranges disclosed by the prior art, a *prima facie* case of obviousness exists (MPEP 2144.05).

14. Robbart teaches all the limitations of **Claims 17 and 18** as set forth above in paragraph 8, except for a method wherein the exposure is performed for a

continuous exposure time of from about 3 minutes to about 30 minutes, particularly of from about 10 minutes to about 20 minutes. However, Robbart does teach that the contact time will vary depending on a number of factors, such as the temperature, the concentration of the silane, the pressure within the reaction zone, and the moisture content of the substrate (Col.3, lines 23 – 56). In other words, Robbart teaches that the exposure time is a result / effective variable that is determined by a combination of other process parameters. Therefore, it would have been obvious to one of ordinary skill in the art to optimize the exposure time in the process of Robbart as a result / effective variable through routine experimentation based on the specific combination of process parameters used by the purveyor in the art during the exposure (e.g., the temperature, the concentration of the silane, the pressure within the reaction zone, and the moisture content of the substrate, as taught by Robbart).

15. **Claims 1 – 6, 9, 10, and 13 – 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung et al. (USPN 6,576,489 B2) in view of Mayer et al. (“Chemical vapor deposition of fluoroalkylsilane monolayer films for adhesion control in microelectromechanical systems”, Sept/Oct 2000) for the reasons set forth in paragraph 9 of the previous Office Action.
16. **Claims 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Leung et al. (USPN 6,576,489 B2) in view of Mayer et al., in further view of Breen et

al. (US 2002/0172895 A1) for the reasons set forth in paragraph 11 of the previous Office Action.

17. **Claims 1 – 5 and 13 – 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (USPN 6,190,003 B1) for the reasons set forth in paragraph 13 of the previous Office Action.
18. Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (USPN 6,190,003 B1) in view of Kim et al. ("A new class of surface modifiers for stiction reduction", 1999).
19. Sato et al. teaches all the limitations of **Claims 6 and 21** as set forth above in paragraph 17, except for a method wherein the surface is hydroxyl-terminated polysilicon. However, Sato et al. does teach that the surface is hydroxyl-terminated silicon in general (Figure 6 and Col.7, lines 49 – 52) and the deposition process is carried out so that components do not stick together (Abstract). Kim et al. teaches that silane coatings such as those deposited on the surface of Sato et al. are generally deposited on polysilicon in order to avoid "stiction" (Abstract and page 189). Therefore, it would have been obvious to one of ordinary skill in the art to perform the process of Sato et al. specifically on a hydroxyl-terminated polysilicon surface (i.e., as opposed to a hydroxyl-terminated silicon surface in general) with the reasonable expectation of success and obtaining similar results, regardless of whether the silicon surface of Sato et al. is polycrystalline or amorphous.

20. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (USPN 6,190,003 B1) in view of either Schnable et al. (USPN 4,196,232) or Arkles et al. (USPN 6,586,056 B2).

21. Sato et al. teaches all the limitations of **Claims 9 and 10** as set forth above in paragraph 17, except for a method wherein the gaseous mixture used during the exposure consists of DCDMS, water vapor, and an inert gas, particularly molecular nitrogen. Specifically, Sato et al. reasonably suggests that the gaseous mixture consist of water vapor and DCDMS (Col.10, lines 4 – 14, Col.12, lines 27 – 46) and is silent regarding the inclusion of any inert gas such as nitrogen. Sato et al. teaches that moisture is added to the atmosphere at some point during the deposition process (Col.10, lines 13 – 14), but is silent as to how the moisture is added. Schnable et al. teaches that, in a CVD process involving a gaseous silane, water vapor is added to the atmosphere by passing an inert gas such as molecular nitrogen (N₂) through a bubbler containing water in order to saturate the nitrogen with water vapor, and then introducing the saturated nitrogen gas into the reaction chamber atmosphere (Col.2, lines 24 – 40). It would have been obvious to one of ordinary skill in the art to introduce the moisture (water vapor) to the atmosphere in the process of Sato et al. by using the method of Schnable et al. (i.e., passing an inert gas such as molecular nitrogen (N₂) through a bubbler containing water in order to saturate the nitrogen with water vapor, and then introducing the saturated nitrogen gas into the atmosphere) with the reasonable expectation of successfully and

advantageously using a well-known method of introducing water vapor into a silane-containing atmosphere in a vapor deposition process. In other words, by using the process of Schnable et al. to introduce the water vapor, the goal of Sato et al. (i.e., adding moisture to the atmosphere) is beneficially achieved. In performing this process, the gaseous mixture used during the exposure consists of DCDMS, water vapor, and an inert gas, particularly molecular nitrogen, as claimed by the applicant. Alternatively, Arkles et al. teaches that it is typical to use a carrier gas such as nitrogen with a silane precursor gas during a vapor deposition process (Abstract, Col.6, lines 48 – 51). Therefore, it would have been obvious to one of ordinary skill in the art to include a carrier gas such as nitrogen along with the DCDMS and the water vapor in the process of Sato et al. with the reasonable expectation of successfully and advantageously delivering the gases / vapors to the deposition area while using a carrier gas (e.g., nitrogen) to regulate their flow and introduction, as is well-known in the art as exhibited by Arkles et al.

22. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (USPN 6,190,003 B1) in view of Robbart.

23. Sato et al. teaches all the limitations of **Claims 11 and 12** as set forth above in paragraph 17, except for a method wherein the DCDMS is at a partial pressure of from about 0.5 torr to about 5 torr, particularly from about 1.0 to about 3.0 torr. Specifically, Sato et al. is silent regarding the partial pressure of the DCDMS. However, Robbart teaches that, in the art of vapor depositing a coating from a silane

such as DCDMS (e.g., a process analogous to that of Sato et al.), the concentration of the silane in the atmosphere (i.e., the “partial pressure” of the silane) is a variable that influences other factors, such as how long the exposure / deposition should last (Col.3, lines 22 – 56). In other words, Robbart teaches that the concentration / partial pressure of the silane in the atmosphere is a result / effective variable that influences how long the substrate should be exposed to the atmosphere. Therefore, it would have been obvious to one of ordinary skill in the art to optimize the DCDMS partial pressure in the process of Sato et al. as a result / effective variable through routine experimentation (e.g., in order to optimize the silane exposure time).

Response to Arguments

24. Applicant's arguments filed on 6/21/2004 have been fully considered but they are not persuasive.
25. First and regarding the combination of Leung et al. with Mayer et al., the applicant argues that Leung et al. teaches that water should be avoided since it interferes with vapor-phase reactions, while Mayer et al. expressly include water in the atmosphere with no mention of interference with the reaction, which combined teaching is a contradiction. The applicant also notes that the silane compound taught by Mayer et al. is quite different than the applicant's claimed silane compound, and that the Mayer et al. publication represents work performed and published earlier than Leung et al. (and thus can hardly be termed an improvement). In response, this argument is not convincing. To begin, the examiner does recognize that the teachings of Leung

et al. (e.g., to avoid water vapor) and Mayer et al. appear, on the surface, to be contradictory. However, after careful consideration, the examiner maintains that there is both sufficient motivation and a reasonable expectation of success when combining the teachings of Leung et al. and Mayer et al. in the manner done so by the examiner. While Mayer et al. is, on the whole, directed to using FOTS as the silane precursor, Mayer et al. explicitly teaches the following: "It is often assumed that chlorosilanes (emphasis added by examiner) will react with surface hydroxyl groups to form covalent linkages to the surface. However, Klaus and co-workers have found that surface hydroxyl groups react with gaseous chlorosilanes only at high temperatures and high doses of the chlorosilane" (page 2436, section B., paragraph 2). The solution to this problem taught by Mayer et al. is to add water vapor during the exposure. The aforementioned teaching of Mayer et al. clearly shows that the problem (i.e., getting chlorosilanes to react with surface hydroxyl groups to form covalent linkages to the surface) is not limited to FOTS (as suggested by the applicant), but is applicable to chlorosilanes in general. Therefore, one of ordinary skill in the art would have been motivated to add a small amount of water vapor to the chlorosilane-containing gaseous mixture of Leung et al. with the reasonable expectation of successfully and advantageously improving the deposition process (e.g., forming a stable film, without the need to use high temperatures and high doses of the chlorosilane, as taught by Mayer et al.). The fact that the Mayer et al. publication represents work performed and published earlier than Leung et al. would not, in and of itself, indicate to one of ordinary skill in the art that using water

vapor in the process is not an improvement (e.g., because there is no indication that Leung et al. had knowledge of the work of Mayer et al. when stating that the exposure should be performed in the absence of water vapor).

26. Second and regarding the Sato et al. reference, alone and in combination, the applicant argues that the explicit statement of Sato et al. (i.e., "Experiments showed that what has been discussed above with reference to HMDS applies to other members of the group in substantially the same way") is disproved by the applicant's results. To support this argument, the applicant states that (1) performing the deposition in air vs. a non-oxidizing atmosphere, (2) performing the deposition at atmospheric pressure vs. performing it at a pressure less than 100 torr, and (3) completing the deposition in twenty hours vs. ten minutes are not "substantially the same way". In response, this argument is not convincing. The examiner respectfully submits that the applicant is misinterpreting the statement of Sato et al. that "Experiments showed that what has been discussed above with reference to HMDS applies to other members of the group in substantially the same way". This statement simply indicates that the process explicitly taught by Sato et al. in regards to HMDS can also be practiced with "other members of the group" (e.g., DCDMS). The statement is not meant to show or imply that (1) performing the deposition in air vs. a non-oxidizing atmosphere, (2) performing the deposition at atmospheric pressure vs. performing it at a pressure less than 100 torr, and (3) completing the deposition in twenty hours vs. ten minutes are substantially the same. On the contrary, the conditions of the process of Sato et al., including (1) the specific vapor-

phase silane compound utilized, (2) the specific substrate / surface material treated, (3) the process temperature, (4) the process pressure, and (5) the exposure time are the same as the applicant's claimed and disclosed process conditions. Finally, the applicant argues that no one skilled in the art would think that a process that is known to require a twenty-hour exposure time could be done in only ten minutes. In response, one embodiment of Sato et al. is performed in air at atmospheric pressure, and requires 20 hours of exposure time, as stated by the applicant. However, Sato et al. also teaches that the process is not limited to such an embodiment and can be performed for a period between 5 and 150 minutes at a vacuum of 10 Torr or greater (Col.9, lines 34 – 50)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Martin (US 2003/0211650 A1) teaches a method of vapor depositing a silane coating on a surface of a MEMS device in order to reduce stiction. Okamura et al. (USPN 5,521,126) teaches a CVD method that comprises depositing a siloxane film on a substrate by using DCDMS and water vapor as precursors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571) 272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

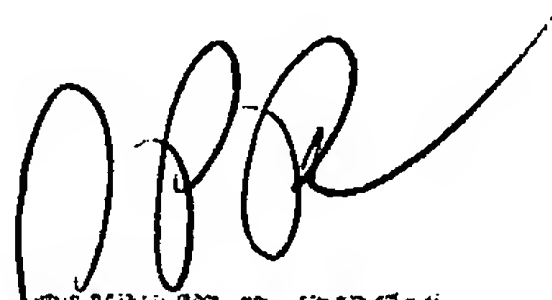
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



WDM

Wesley D Markham
Examiner
Art Unit 1762



SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
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